

EARLY CATHETER REMOVAL AND POSTOPERATIVE STATUS OF BLADDER OUTFLOW AFTER RETROPUBIC RADICAL PROSTATECTOMY

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Cystography was performed on 35 patients 6 to 7 days after retropubic radical prostatectomy (RRP), to determine the feasibility of early removal of the urinary catheter. The urethral catheter was removed the same day if no extravasation was evident on cystography. Uroflowmetry was also performed both immediately after early catheter removal and at follow-up 4 to 20 months later. The urethral catheter could be removed on postoperative day 6 or 7 from all but one patient. Three patients developed acute urinary retention after catheter removal, requiring reinsertion of a Foley catheter. During a mean follow-up of 8.3 months (range 4 to 20 months), 25 patients (71.4%) reported excellent continence (requiring no pad) and seven patients (20%) good continence (requiring a single pad). Immediately after early catheter removal, 12 patients (34%) showed obstruction on a maximum flow nomogram. The number of patients with obstruction decreased to eight during follow-up, three of whom suffered anastomotic stricture and one anterior urethral stricture, all of which required urethrotomy.

Our results show that early catheter removal can be accomplished safely, although some patients may have difficulty with urination or develop acute urinary retention immediately after catheter removal, probably due to anastomotic edema. On the other hand, if the patients develop difficulty in urination some time after the operation, the possibility of anastomotic or urethral stricture should be considered. Therefore we recommend uroflowmetry within one year after RRP to identify anastomotic or urethral stricture.

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Key words: Retropubic radical prostatectomy, Early catheter removal, Uroflowmetry

INTRODUCTION

The conventional urethral catheterization period after retropubic radical prostatectomy (RRP) is 2 to 3 weeks¹⁾. This protracted catheterization is a source of significant discomfort and anxiety for patients after RRP²⁾, while perioperative hospital stays in Japan after RRP have recently become shorter.

In this context, the objective of our study was to determine the feasibility of removing the urinary catheter 6 to 7 days after RRP. Since some patients complained of difficulty with urination or developed acute urinary retention after early catheter removal, we also determined the postoperative uroflowmetric parameters immediately after early catheter removal and at follow-up 4 to 20 months later to assess the postoperative status of bladder outflow.

SUBJECTS AND METHODS

A total of 35 patients who underwent RRP between December 2000 and January 2003 were included in this study. RRP was performed in a manner similar to that described by Walsh³⁾. Bladder neck reconstruction was performed until the opening was

approximately 1 cm in diameter, so that the tip of the index finger could be inserted. Five anastomotic sutures were placed with 2–0 vicryl. A 20 Fr Foley catheter was then inserted and left in place, while two closed suction drains were placed on both sides of the anastomosis. Cystography using 150 to 200 cc contrast medium was performed 6 to 7 days after RRP. If there was no sign of leakage, the urethral catheter was removed the same day. Uroflowmetry combined with determination of the maximum flow nomogram according to Siroky was performed both immediately after early catheter removal and at follow-up 4 to 20 months later. Complications and continence were assessed at a mean follow-up of 8.3 months (range 4 to 20 months) by means of a self-reported patient questionnaire. Wilcoxon signed rank test was used for the analysis of the uroflowmetric parameters.

RESULTS

The baseline characteristics of the patient are summarized in Table 1. There was no sign of extravasation in any of the cases except one. The catheter was removed from 27 patients on

Table 1. Baseline characteristics of study population (n=35)

Baseline characteristics	Value
Age (Yr)	69.4 $\pm$ 5.1 (58–77)
PSA (ng/ml)	8.59 $\pm$ 4.77 (2.2–21.7)
Clinical stage	
T1c	25 (71.4%)
T2	10 (28.6%)
PSA (ng/ml)	
0–4	5 (14.3%)
4–10	21 (60 %)
>10	9 (25.7%)
Gleason score (biopsy)	
2–6	25 (71.4%)
7	6 (17.1%)
8–10	4 (11.4%)
Pathological stage	
T2	27 (77.1%)
T3	7 (20 %)
T4	1 (2.9%)

Table 2. Complications related to early catheter removal

Complication	n (%)
Acute urinary retention	3 (8.6%)
Anastomotic stricture	3 (8.6%)
Anterior urethral stricture	1 (2.9%)

postoperative day 6 and from seven patients on day 7. Mild extravasation was observed in one patient, but since repeat cystography revealed no extravasation on postoperative day 11, the catheter was removed.

The complications likely attributable to early catheter removal are shown in Table 2. For three patients who developed acute urinary retention within 24 hours, the urinary catheter was safely reinserted without endoscopic assistance, and all three could void well after a further 5 days of catheter drainage. Three patients suffered anastomotic stricture 3, 5 and 8 months postoperatively, which required urethrotomy in all cases, and in one case an anterior urethral stricture was treated with an endoscopic urethrotomy.

Urinary continence is shown in Table 3. The percentage of patients who did not require any pad or only one pad after a minimum follow-up of 4 months was 91%.

Uroflowmetric parameters and the maximum flow

Table 3. Urinary continence (4–20 months after RRP)

Pads (n)	n (%)
0	25 (71.4%)
1	7 (20 %)
2	2 (5.7%)
≥ 3	1 (2.9%)

Table 4. Uroflowmetric parameters

	Immediately after catheter removal	At follow-up
Peak flow rate (ml/s)	14.4 $\pm$ 6.8	18.2 $\pm$ 9.1*
Voided volume (ml)	166.6 $\pm$ 78.0	205.4 $\pm$ 93.1*

*: $p < 0.05$.

nomogram obtained immediately after early catheter removal and at follow-up 4 to 20 months later are shown in Table 4, Fig. 1 and Fig. 2. Immediately after early catheter removal, 12 patients (34%) showed obstruction on the maximum flow nomogram

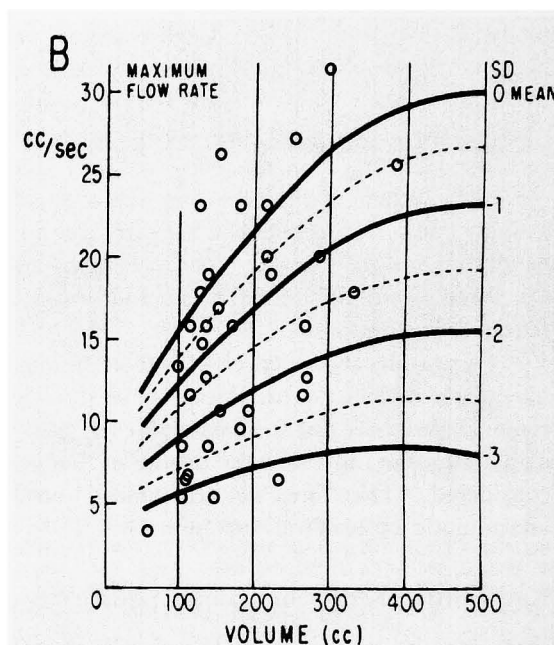


Fig. 1. Maximum flow nomogram immediately after catheter removal.

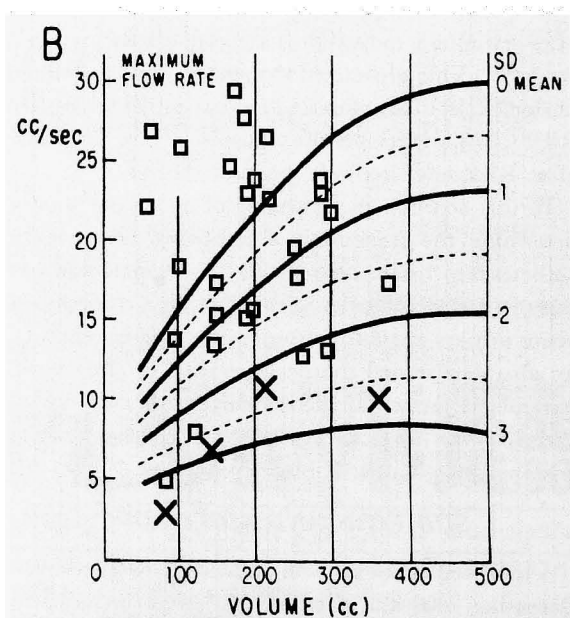


Fig. 2. Maximum flow nomogram at follow-up (X: urethral stricture or anastomotic stricture).

Table 5. Early catheter removal investigations

		POD folly out	No. Pt	Anastomotic stricture (%)	Retention (%)	Hematuria (%)	Continence (%) (no pad)	Follow up (month)
Dalton	1989 ⁹⁾	8-46*	55	18	9	0	84	minumum 8
Little Jr	1995 ¹⁰⁾	4- 5	27	0	0	7.4	70	minumum 6
Coogen	1997 ¹¹⁾	3- 6	43	2.3	0	4.6	69	6-25
Souto	2000 ¹²⁾	5- 6	30	0	6.7	0	76	5-27
Santis	2000 ¹³⁾	8- 9	100	9	2	0	76	21
DeMarco	2000 ¹⁴⁾	3- 4	70	1.4	0	5.7	69	minumum 6
Lepor	2001 ¹⁵⁾	7	130	7	15.2	0	44 (72.5**)	3
Albani	2002 ¹⁶⁾	3- 4	19	0	0	0	42.1 (57.9**)	3
Patel	2003 ⁷⁾	3- 4	114	12.1	19.3	0	39.7 (75.0**)	3
Koch	2003 ¹⁾	3- 4	263	1.1	3.6	1.9	89.2	6-21
Present study		6- 7	35	8.6	8.6	0	71.4	4-20

*: mean 13. **: required no or one pad.

(flow nomogram score: < -2 standard divisions). At follow-up 4 to 20 months after catheter removal, the number of patients who still suffered obstruction as seen on the nomogram had decreased to eight. However, four of these patients showed urethral or anastomotic stricture.

DISCUSSION

While recent laparoscopic techniques have introduced catheter removal protocols as brief as 2-4 days^{4,5)}, early catheter removal is not a novel idea, since several groups previously reported early removal following open RRP (Table 5). All of these studies confirm that early catheter removal is safe.

Urinary continence following RRP continues to be a major concern for patients, and the incidence of significant postprostatectomy incontinence in modern series ranges from 5% to 30%⁶⁾. The complete continence rate for patients after early catheter removal was slightly worse than that recently reported, but a longer follow-up is required for an accurate comparison.

The incidence of urinary retention after early catheter removal ranges from 0% to 19.3%. We consider that the etiology for retention is probably postoperative edema or wound pain. Although all our patients experiencing acute urinary retention could have their catheters reinserted without complication, Patel et al.⁷⁾ described two cases who required a repeat operation for complications resulting from acute urinary retention. Care must thus be taken when reinserting the urethral catheter in cases of acute urinary retention after early catheter removal.

The incidence of anastomotic stricture reported in the literature ranges between 0.5% and 32%⁸⁾, and other and our results indicate that early catheter removal does not increase this incidence.

Our study is unique in that we routinely performed uroflowmetry immediately after catheter removal and at follow-up of 4 to 20 months later to examine the postoperative status of bladder outflow. Im-

mediately after catheter removal, 12 patients showed obstruction on the maximum flow nomogram, but we consider that the reason was not anastomotic stricture but postoperative edema of anastomosis. At follow-up 4 to 20 months later, the number of patients with obstruction detected on the nomogram had decreased to eight. However, four of these patients suffered from urethral stricture or anastomotic stricture confirmed by cystourethroscopy. Dark et al.⁸⁾ reported 72% of anastomotic strictures developed within 6 months of RRP, and 97% within a year. Since uroflowmetry is the simplest and easiest urodynamic study to perform, we recommend it within 6 to 12 months after RRP.

In conclusion, our study shows that early catheter removal can be accomplished safely, although some patients may have difficulty in urination or develop acute urinary retention immediately after catheter removal, probably due to anastomotic edema. On the other hand, if a patient has difficulty with urination some time after surgery, the possibility of anastomotic or urethral stricture must be taken into account. We therefore recommend uroflowmetry within one year after RRP to identify anastomotic or urethral stricture.

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和文抄録

前立腺全摘後における尿道カテーテル早期抜去と
その後の排尿状態についての臨床的検討

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【目的】 前立腺全摘後6日目または7日目に尿道カテーテルを抜去し，その安全性，術後の排尿状態について臨床的検討を加えた。

【方法】 前立腺全摘術後35例に対し，6日目または7日目に膀胱造影施行し漏れがなければ尿道カテーテルを抜去した。Uroflowmetry はカテーテル抜去直後と外来 follow 時（4～20ヵ月）に施行した。

【結果】 1例を除き尿道カテーテルを早期抜去できたが，抜去直後3例に尿閉を認め尿道カテーテルを再留置した。尿失禁に関しては excellent（pad 必要なし）が25例（71.4%），good（pad が1枚以下）が7例（20%）であった。抜去直後 uroflowmetry の

maximum flow nomogram では12例に排尿困難を認めたが，外来 follow 時では8例に減少していたが，そのうち3例に吻合部狭窄，1例に尿道狭窄を認めた。

【結論】 尿道カテーテル早期抜去は安全に施行できると考えられたが，抜去直後に排尿困難や尿閉をきたす症例があり，おそらく吻合部の浮腫が原因と考えられる。一方，術後しばらくしてから排尿困難を訴える場合は吻合部狭窄や尿道狭窄を念頭に置く必要がある。術後1年以内に uroflowmetry を施行し狭窄の有無を調べる必要があると考えられた。

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